

REMARKS

Status of Claims

Claims 1, 2, 5-18, 21-22, 25-27, 30-33, and new claims 34-38 are currently pending, with claims 1, 25 and 32 being independent. Claims 1, 2, 6, 21, 25, 26, 30, and 32 have been amended to even more clearly recite and distinctly claim particularly preferred embodiments of the present invention. Claims 34-38 have been added. Support for the amendments and new claims can be found throughout the specification including, for example, in the original claims, at page 10, lines 17-18, at page 10, line 28 – page 11, line 1, and at page 19, line 30 – page 20, line 1. Accordingly, no new matter has been added.

Applicants respectfully request the Examiner to reconsider and withdraw the outstanding rejections in view of the foregoing amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1, 2, 5-18, 21, 25-27, and 30-31 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 2,877,257 (“Cain”) in view of U.S. Publication No. 2002/0173556 (“Moore”). Applicants respectfully disagree with this rejection, therefore, this rejection is respectfully traversed.

Cain relates to a process for the purification of ***hydrocarbon solutions of oxygenated organic compounds*** comprising acids and which also may contain dissolved or occluded metal contaminants such as iron or iron compounds. (Column 1, Lines 15-19). Cain discloses that ***the contaminated oxygenated products*** can be produced by synthesis when carbon monoxide and hydrogen are reacted with a fluidized iron catalyst. (Column 1, Lines 26-36, Column 5, Lines 14-15). Cain discloses that the oil stream produced from the process contains large amounts of acids, alcohols, ketones, aldehydes, and esters. (Column 1, Lines 36-50). Applicants respectfully submit that these oxygenates are not paraffinic species. Accordingly, the product of Cain contains large amounts of ***non-paraffinic species***. Cain also discloses that the product produced from the process contains dissolved or occluded metal contaminants such as iron or iron compounds. (Column 1, Lines 51-54).

With regard to the purification process, Cain discloses that the crude hydrocarbon synthesis oil containing a large amount of acids, alcohols, ketones, aldehydes, and esters (as described above) is washed with an aqueous acid solution. Such washing produces aqueous acid extract containing ***dissolved chemicals including water soluble chemicals, iron salts,***

and salts of basic nitrogen compounds and washed primary oil. Washing is repeated until no brown precipitate is produced on the addition of a suitable base to the acid extract. (Figure 2, Column 7, Lines 40-51, and Column 2, Lines 19-25, emphasis added). The *dissolved* chemicals present in the aqueous acid extract are recovered by distillation and the acid returned for use in a subsequent extraction step. (Column 3, Lines 44-47, emphasis added).

Moore is merely cited for the propositions that Fischer-Tropsch streams are produced in processes that utilize catalysts such as iron or cobalt catalysts and that Fischer-Tropsch derived streams may be fractionated (i.e. distilled) and hydrotreated. Office Action at page 4.

In contrast, amended independent claims 1 and 25 are directed to methods of removing contamination from a *Fischer-Tropsch derived paraffinic product* by removing Al contamination in particulate form. The processes comprise conducting a Fischer-Tropsch process in a slurry type reactor using a catalyst comprising cobalt at a temperature range of about 400 to 550°F to produce a *Fischer-Tropsch derived paraffinic product*. The Al contamination in particulate form is removed from this *Fischer Tropsch derived paraffinic product*.

As described above, Cain relates to a process for the purification of *hydrocarbon solutions of oxygenated organic compounds* comprising acids. Cain discloses that *the contaminated oxygenated products* can be produced by synthesis when carbon monoxide and hydrogen are reacted with a *fluidized iron catalyst*. (Column 1, Lines 26-36, Column 5, Lines 14-15).

In contrast, amended claims 1 and 25 relates to a method of removing contamination from a Fischer-Tropsch derived *paraffinic product*. The methods comprise conducting a Fischer-Tropsch process in a *slurry type reactor* using a *catalyst comprising cobalt* at a temperature range of about 400 to 550°F to produce a Fischer-Tropsch derived *paraffinic product* stream; passing the Fischer-Tropsch derived paraffinic product stream to a treatment zone; passing an aqueous acidic stream to the treatment zone; and contacting the Fischer-Tropsch derived paraffinic product stream with the aqueous acidic stream in the treatment zone to remove Al contamination in particulate form.

Cain in view of Moore does not disclose or suggest a method for removing contamination from a *Fischer-Tropsch derived paraffinic product*. As discussed above, Cain relates to a process for the purification of *hydrocarbon solutions of oxygenated organic compounds* comprising acids. Accordingly, the product stream of the presently claimed

process and the product stream of Cain are significantly different. The product stream of Cain containing large amounts of acids would react significantly differently than the presently claimed paraffinic product stream when contacted with an aqueous acidic stream. Applicants respectfully submit that the phase equilibria established when contacting these respective streams with an aqueous acidic stream is completely different.

Moreover, Cain in view of Moore does not disclose or suggest removing *Al contamination in particulate form*. In the process for purification, Cain extracts dissolved or occluded iron contamination from crude hydrocarbon solutions of oxygenated organic compounds with an aqueous acid solution. The acid extract retains the iron contamination in the form of dissolved chemicals including iron salts.

Moreover, Applicants respectfully submit that Cain in view of Moore does not disclose or suggest filtering the at least one acidic extracted Fischer-Tropsch derived hydrocarbon stream to remove at least a portion of the Al contamination in particulate form. Cain does not have any use for a filtration step.

Applicants respectfully submit that the process of Cain is significantly different than the presently claimed method of removing contamination from a Fischer Tropsch derived paraffinic product. Accordingly, Applicants respectfully submit that one of skill in the art would not look to Cain for guidance when faced with the problem of removing Al contamination from a paraffinic stream.

Therefore, for at least the above reasons, withdrawal of the § 103(a) rejection over Cain in view of Moore is respectfully requested.

Claim 22 stands rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Cain in view of Moore and further in view of U.S. Patent No. 6,476,086 (“Zhou”). Applicants respectfully disagree with this rejection; therefore, this rejection is respectfully traversed.

As described above, Cain does not disclose or suggest a method for removing contamination from a *Fischer-Tropsch derived paraffinic product*. As discussed above, Cain relates to a process for the purification of *hydrocarbon solutions of oxygenated organic compounds* comprising acids. Accordingly, the product stream of the presently claimed process and the product stream of Cain are significantly different. Therefore, Applicants respectfully submit that one of skill in the art would not look to Cain for guidance when faced with the problem of removing Al contamination from a paraffinic stream.

Moore is merely cited for the propositions that Fischer-Tropsch streams are produced in processes that utilize catalysts such as iron or cobalt catalysts and that Fischer-Tropsch derived streams may be fractionated (i.e. distilled) and hydrotreated.

Cain in view of Moore does not disclose or suggest a method for removing contamination from a *Fischer-Tropsch derived paraffinic product*. Cain in view of Moore does not disclose or suggest removing *Al contamination in particulate form*. Moreover, Applicants respectfully submit that Cain in view of Moore does not disclose or suggest filtering the at least one acidic extracted Fischer-Tropsch derived hydrocarbon stream to remove at least a portion of the Al contamination in particulate form.

Zhou is cited merely as disclosing using a surfactant and disclosing filtration techniques to separate solid contaminants.

As cited, Zhou does not correct the many above-noted deficiencies of Cain in view of Moore.

Therefore, for at least the above reasons, withdrawal of the § 103(a) rejection of claims 19-20, 22, and 28-29 over Cain in view of Moore and further in view of Zhou is respectfully requested.

Claims 32 and 33 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Cain in view of Moore et al. and further in view of Zhou. Applicants respectfully disagree with this rejection; therefore, this rejection is respectfully traversed.

As described above, Cain relates to a process for the purification of hydrocarbon solutions of *oxygenated organic compounds comprising acids* and which also may contain dissolved or occluded metal contaminants such as iron or iron compounds.

Also as described above, Moore is cited as disclosing that Fischer Tropsch streams are produced in processes that utilize iron or cobalt catalysts. Moore is also cited as disclosing “that F-T derived streams may be fractionated (i.e., distilled) and hydrotreated.”

Zhou relates to a method for separating iron-based catalyst fines from hydrocarbon liquid/wax/catalyst slurry for Fischer-Tropsch synthesis processes by contacting and/or mixing the slurry with a coalescence enhancing treating solution to facilitate gravity separation and settling of such catalyst, and thereby yield a substantially clean hydrocarbon liquid/wax product. (Abstract). Zhou discloses that the treating solution includes a surface tension reducing agent, an agglutinating agent, and a coalescing agent, each in selected

proportions in aqueous solution. (Abstract). Zhou is cited as disclosing filtration techniques used to separate solid contaminants from Fischer Tropsch derived streams.

As described above, the presently claimed process is significantly different than the process of Cain and one of skill in the art would not merely combine process features of Moore with Cain.

Moreover, it is respectfully maintained that in no way does Cain, Moore, or Zhou disclose or suggest providing an additive to the contents of the Fischer-Tropsch reactor to precipitate soluble contamination within the reactor. Applicants note that the Examiner asserts that it would have been obvious to one having ordinary skill in the art to have modified the process of Cain by adding the acid to the reactor because the same purification would take place with the added benefit of cost savings due to the reduced equipment requirement.

Applicants note, however, that it would not be practical or of added benefit to add a water solution of acetic acid to the Fischer Tropsch reactor. Fischer Tropsch reactions are conducted at temperatures of 400 – 550 °F, as presently claimed. A water solution would significantly cool the reactor causing the reactor to need to be reheated to reaction temperature to conduct Fischer Tropsch reactions. Furthermore, a water solution would evaporate at the reaction temperatures, and thus, could not be used to extract the product inside the reactor, unless first the reactor was cooled significantly and then heated again to reaction temperature. All of these possibilities for using the water solution in the reactor would not be practical or of added benefit, if possible at all. Applicants respectfully note that the Examiner did not address why it is alleged to remain obvious to add the acid to the reactor in light of the above-noted problems in doing so.

Accordingly, for at least the above described reasons, Applicants respectfully request that the obviousness rejection of claims 32 and 33 over Cain in view of Moore and Zhou be withdrawn.

Conclusion

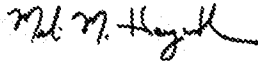
For the reasons noted above, the art of record does not disclose or suggest the inventive concept of the present methods as defined by the claims.

In view of the foregoing amendments and remarks, reconsideration of the claims and allowance of the subject application is earnestly solicited. In the event that there are any

questions relating to this application, it would be appreciated if the Examiner could telephone the undersigned attorney concerning such arguments so that prosecution of this application may be expedited.

If necessary for a timely response, this paper should be considered as a petition for an Extension of Time, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #103904.B500790).

Respectfully submitted,



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